US 20160335299A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2016/0335299 A1**

Vemulapati et al. (43) **Pub. Date: Nov. 17, 2016**

(54) **HIERARCHICAL DATA STORAGE**

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(21) Appl. No.: **14/833,015**

(22) Filed: **Aug. 21, 2015**

Related U.S. Application Data

(60) Provisional application No. 62/159,921, filed on May 11, 2015.

Publication Classification

(51) **Int. Cl.**
G06F 17/30 (2006.01)

(52) **U.S. Cl.**
CPC ... ***G06F 17/30327*** (2013.01); ***G06F 17/30342*** (2013.01); ***G06F 17/30094*** (2013.01); ***G06F 17/30132*** (2013.01)

(57) **ABSTRACT**

System, method, and computer program product key compression and cached-locking are described. A computer system can store database files or operating system files in a tree data structure. The system can store data or metadata as key-value pairs in nodes of the tree data structure. The keys in the key-value pairs can have a hierarchical structure, which may or may not correspond to the tree data structure. The system can compress the keys by reducing duplicated storage of shared portions of the keys. The system can use an index in a tree node to represent the hierarchical structure of the key-value pairs stored in that tree node. To access a value in a key-value pair, the system can identify the tree node to search, query the index in that tree node to locate the value, and then access the value at the indexed location.